UKPSC JE PAPER – 2 (2023)

Q1. Which stroke is not there in a 2-stroke engine?

(a) Compression

(b) Expansion

(c) Exhaust

(d) Both (a) and (b)

Ans:

Q2. Which of the following refrigerant is not harmful for ozone layer?

(a) R - 12

(b) R - 11

(c) R - 22

(d) R – 134 a

Ans: d

Q3. Hot air engine is an example of

(a) Internal combustion engine

(b) Rotary engines

(c) Rotary and reciprocating engines

(d) External combustion engine

Ans:

Q4. The thermodynamic cycle on which the petrol engine works is:

(a) Otto cycle

(b) Joule cycle

(c) Rankine cycl

(d) Stirling cycle

Ans: a

Q5. The frictional Power (F.P.) is given by:

Where

(B.P. = Brake Power, I.P. = Indicated Power)

(a) F.P. = B.P. – I.P.

(b) F.P. = I.P. – B.P.

(c) F.P. = B.P./I.P.

(d) F.P.= I.P./B.P.

Ans: b

Q6. The octane number of petrol, generally available is:

(a) 20 to 40

(b) 40 to 60

(c) 60 to 80

(d) 80 to 100

Ans: c

Q7. Piston rings are usually made of

(a) Cast iron

(b) Aluminium

(c) Brass

(d) Carbon Steel

Ans: a

Q8. The spark plug gap normally in petrol engine is:

(a) 0.1 TO 0.2 mm

(b) 0.2 to 0.4 mm

(c) 0.6 to 1.8 mm

(d) 2 to 3 mm

Ans:

Q9. Calorific value of diesel oil is:

(a) 3000 kcal/kg

(b) 5000 kcal/kg

(c) 7500 kcal/kg

(d) 10000 kcal/kg

Ans:

Q10. In forced circulation boilers, about 90% of water is recirculated without evaporation. The circulation ratio is:

(a) 0.1

(b) 0.9

(c) 9

(d) 10

Ans: b

Q11. Arrange Pelton, Francis and Kaplan turbines in the decreasing order of specific speed.

(a) Kaplan, Francis, Pelton

(b) Francis, Kaplan, Pelton

(c) Pelton, Francis, Kaplan

(d) Francis, Pelton, Kaplan

Ans: a

Q12. The ratio $\frac{\text{Heat convertd into useful work}}{\text{Total adiabatic heat drop}}$ in turbine is called

(a) Rankine efficiency

(b) Blade efficiency

(c) Overall efficiency

(d) Internal efficiency

Ans: d

Q13. In which type of turbine, the expansion of steam does not take place in the moving blade?

(a) Impulse turbine

(b) Reaction turbine

(c) Mixed turbine

(d) None of these

Ans:

Q14. Morse test is conducted for

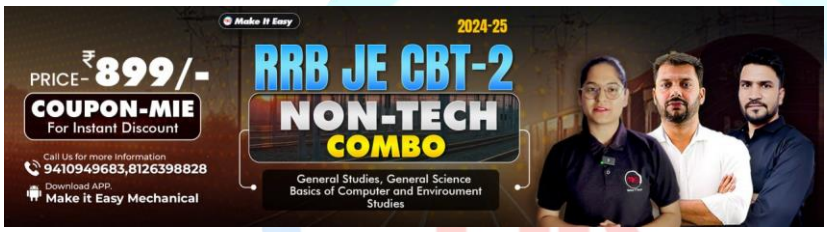
(a) Single cylinder engine only

(b) Single cylinder and multi cylinder engine both.

(c) Multi cylinder engine only

(d) None of these

Ans: c



Q15. The order of values of thermal efficiency of Otto, Diesel and Dual Cycles, when they have equal compression ratios and heat rejections, is given by

(a) $\eta_{\text{otto}} > \eta_{\text{diesel}} > \eta_{\text{dual}}$

(b) $\eta_{diesel} > \eta_{\text{dual}} > \eta_{\text{otto}}$

(c) $\eta_{\text{dual}} > \eta_{\text{diesel}} > \eta_{\text{otto}}$

(d) $\eta_{\text{otto}} > \eta_{\text{dual}} > \eta_{\text{diesel}}$

Ans: d

Q16. The part load and thermal efficiency of two stroke cycle engines as compared to four stroke cycle engines is:

(a) Higher.

(b) Equal

(c) Unpredictable

(d) Lower

Ans:

Q17. The efficiency of an Otto cycle is 60% and gamma=1.5 determine the compression ratio.

(a) 5.15

(b) 6.25

(c) 7.25

(d) 8.25

Ans: a

Q18. Which one of the following types of swirls is generated by a pre-combustion chamber in the diesel engine?

(a) Squish

(c) Induction swirl

(b) Compression swirl

(d) Combustion induced swirl

Ans:

Q19. An engine produces 10 kW brake power, while working with a brake thermal efficiency c 30%. If the calorific value of the fuel used is 40,000 kJ/kg, then what is the fuel consumption?

(a) 1.5 kg/hr

(b) 3.0 kg/hr

(c) 0.3 kg/hr

(d) 1.0 kg/hr

Ans: b

Q20. Critical pressure for steam is:

(a) 184 bar

(b) 163 bar

(c) 221 bar

(d) 252 bar

Ans: c

Q21. If v_b = blade speed

v= Absolute velocity of steam entering the blade

α = nozzle angle

The efficiency of an impulse turbine is maximum when :

(a) v_b=0.5 v cos α

(b) v_b= v cos α

(c) v_b= 0.5 v^2 cos α

(d) v_b= v^2 cos α

Ans: a

Q22. Throttle governing in steam turbines:

(a) Leads to significant pressure loss

(b) Increases the efficiency

(c) Increases heat loss

(d) Decreases steam temperature.

Ans: a

Q23. The ratio of work done to the energy supplied to rotor in a turbine stage is called

(a) Blade efficiency

(b) Stage efficiency

(c) Nozzle efficiency

(d) None of these

Ans: a

Q24. A single stage impulse turbine with diameter of 120 cm runs at 3000 rpm. If the blade speed ratio is 0.42, the inlet velocity of steam will be:

(a) 200 m/s

(b) 450 m/s

(c) 900 m/s

(d) 80 m/s

Ans:

Q25. In a surface condenser used in a steam power station, undercooling of condensate is undesirable as this would:

(a) Not absorb the gases in steam

(b) Reduce efficiency of the plant

(c) Increase the cooling water requirements

(d) Increase thermal stresses in the condenser

Ans:

Q26. Formation of steam bubbles on the surface of boiler water is due to:

(a) Low surface temperature of the water

(b) High surface temperature of the water

(c) High surface tension of the water

(d) Low surface tension of the water

Ans:

Q27. Equivalent evaporation may be defined as the amount of water evaporated from water at 100 °C to:

(a) Wet and dry steam at 100 °C

(b) Wet and saturated steam at 100 °C

(c) Dry and saturated steam at 150 °C

(d) Dry and saturated steam at 100 °C

Ans: d

Q28. In Jet condensers:

(a) Cooling water passes through tubes and steam surrounds them.

(b) Steam passes through tubes and cooling water surrounds them.

(c) Steam and cooling water mix.

(d) Steam and cooling water do not mix.

Ans: c

Q29. Phenomenon of choking in compressor means

(a) No flow of air.

(b) Fixed mass flow rate regardless of pressure ratio.

(c) Reducing mass flow rate with increase in pressure ratio.

(d) Increased inclination of chord with air stream.

Ans: b

Q30. The work input of a compressor is minimum when the law followed by compression is:

(a) Isentropic: PV^{γ} = C

(b) Isothermal: PV = C

(c) $PV^{1.35}$= C

(d) $PV^{1.25}$= C

Ans: b

Q31. Convert pressure head of 10 m of water in terms of liquid with specific gravity of 0.8.

(a) 8.5 m

(b) 10.5 m

(c) 11.5 m

(d) 12.5 m,

Ans: d

Q32. The ability of sand to take up the desired shape is known as

(a) Adhesiveness

(b) Cohesiveness

(c) Binding

(d) Flowability

Ans: d

Q33.To completely burn one mole of Acetylene, how many moles of oxygen are required?

(a) 1.0

(b) 1.2

(c) 0.8

(d) 2.5

Ans: d

Q34. Match plate pattern is used in moulding.

(a) Floor

(b) Machine

(c) Three-box

(d) Plate

Ans: b

Q35. Part produced by powder metallurgy is often termed as part.

(a) Cast

(b) Sintered

(c) Machined

(d) None of these

Ans: b

Q36. In a rolling process, the roll separating force can be reduced by

(a) Increasing friction between roll & work-piece.

(b) Providing the back-up roll

(c) Decreasing the roll diameter

(d) Increasing the roll diameter

Ans: b

Q37. Which one of the following options describes the disadvantage of the cold forging process?

(a) Enhanced surface finish

(b) Residual stresses are generated

(c) Elimination of wasted material

(d) Improvement in mechanical properties

Ans: b

Q38. In press working operation, if the sheet metal punched out portion is the required product, then the name of operation is

(a) Piercing

(b) Lancing

(c) Shaving

(d) Blanking

Ans: d

Q39. In powder metallurgy, the desirable compression ratio for making product from metallic powder is:

(a) 3:1

(b) 5:1

(c) 7:1

(d) 9:1

Ans:

Q40. Which of the following is not true about centrifugal casting?

(a) It produces hollow products.

(b) Core is used.

(c) Mould is used.

(d) The mould is rotating.

Ans: b

Q41. In resistance welding, the current in comparison to Arc welding is:

(a) Less

(b) More.

(c) Equal

(d) Current does not flow in resistance welding

Ans: b

Q42. In Tungsten Inert Gas Welding (TIG) which of the gas can be used?

(a) Acetylene (C_2H_2)

(b) Oxygen (O_2)

(c) Helium (He)

(d) All of these

Ans: c

Q43. The speed at which electrode moves or deposition takes place is known as

(a) Electrode speed

(b) Operation speed

(c) Machine speed

(d) Welding speed

Ans: d

Q44. Which of the following is not a refractory material?

(a) Zirconia (ZrO_2)

(b) Alumina (Al_2O_3)

(c) Titanium carbide (TiC)

(d) Iron oxide (FeO)

Ans:

Q45. The water content in green sand for moulding is

(a) 0-1%

(b) 1-4%

(c) 11-13%

(d) 6-8%

Ans:

Q46. In which welding process, the work-piece is kept in vacuum?

(a) Laser Beam Welding

(b) Electron Beam Welding

(c) Plasma Are Welding

(d) All of these.

Ans: b

Q47. In explosive welding which plate is kept at an angle to the horizontal?

(a) Target plate

(b) Flyer plate

(c) Base plate

(d) Both (a) & (b)

Ans: b

Q48. Which chemicals are used during thermit welding?

(a) $Fe+Al_2O_3$

(b) FeO + Al

(c) $FeO + Al_2O_3$

(d) Fe + Al

Ans: c

Q49. In SMAW/MMAW process if the electrode is not removed after touching quickly then

(a) The welding transformer gets burnt

(b) Electrode sticks to the work-piece

(c) Arc is initiated easily

(d) The welder's hand may get burnt

Ans: b

Q50. Among the following, the welding of which material is most difficult?

(a) Mild steel

(b) Low carbon steel

(c) Cast Iron

(d) All are equally difficult

Ans: c

Q51. If metal is poured at a low temperature in mould, which type of defect may occur?

(a) Misrun

(b) Pinhole

(c) Drop

(d) Blow hole

Ans: a

Q52. In shell moulding, the pattern is made up of which material?

(a) Metal

(b) Wood

(c) Plastic

(d) Any of these.

Ans: a

Q53. Penetration of weld is to power density.

(a) Inversely proportional

(b) Equal

(c) Proportional

(d) Has no relation

Ans: c

Q54. In arc welding, the ratio of weight of metal actually deposited with the weight of metal of electrode consumed is known as

(a) Electrode metal ratio

(b) Consumption ratio

(c) Consumption efficiency

(d) Electrode efficiency

Ans:

Q55. What is the input material of a cupola furnace?

(a) Cast Iron

(b) Pig Iron,

(c) Steel

(d) Mild steel

Ans: b

Q56. In which casting process, the pattern is not removed before pouring the liquid metal?

(a) Investment casting.

(b) Lost foam casting

(c) Ceramic mould casting

(d) Shell casting

Ans: b

Q57. Self-lubricating bearing is produced by which process?

(a) Machining

(b) Die casting

(c) Powder metallurgy

(d) Investment casting

Ans: c

Q58. Gullet angle of the teeth of rip saw is upto

(a) 30°

(b) 40°

(c) 50°

(d) 60°

Ans:

Q59. In ultrasonic machining process, the tool material should have

(a) Low toughness & low ductility

(b) High toughness & low ductility

(c) Low toughness & high ductility

(d) High toughness & high ductility

Ans: b

Q60. Which chemical is used for making acetylene in an acetylene generator?

(a) $CaCO_3$

(b) CaC_2

(c) $BaCO_3$

(d) BaO

Ans: b

Q61. Which material is generally used for making swage block?

(a) Mild steel

(b) High strength steel

(c) Pig iron

(d) Cast iron

Ans: d

Q62. If the silica sand particles are rounded in the moulding sand, which of the following increases?

(a) Strength

(b) Porosity

(c) Shrinkage allowance

(d) All of these

Ans: b

Q63. In Galvanized Iron Sheet (GI), zinc is used

(a) To make it flexible

(b) To make it corrosion resistant

(c) To make it cheap

(d) All of these

Ans: b

Q64. Which instrument is not used for the measurement of the thickness of the metal sheet?

(a) Wire gauge

(b) Screw gauge

(c) Steel scale

(d) Vernier callipers

Ans:

Q65. A universal chuck used on lathe machine has

(a) Three jaws

(b) Four jaws

(c) Two jaws

(d) Six jaws

Ans: a

Q66. The tendency for built-up edge formation in chips can be reduced by:

(a) Decreasing the cutting speed

(b) Increasing the depth of cut

(c) Increasing the rake angle

(d) Avoiding the use of cutting fluid

Ans: c

Q67. The thrust force in drilling does not depend on:

(a) Strength of the work-piece material

(b) Feed

(c) Drill diameter

(d) Type of drilling machine used

Ans:

Q68. The material of the lapping tool is the work-piece material.

(a) Harder than

(b) Softer than

(c) As hard as

(d) Any material can be used

Ans: b

Q69. Which one is not related to the shop layout?

(a) Accurate size of land

(b) Area of shop

(c) Cost of product

(d) Number of machines

Ans: c

Q70. Radial lines of wood cells are

(a) Annual rings

(b) Pith

(c) Medullary rays

(d) Cambium layer

Ans: d

Q71. In AJM process nozzles are made of the following material

(a) WC

(b) Low carbon steel

(c) SS

(d) HSS

Ans: a

Q72. For USM, liquid used should not have following property:

(a) Good wetting characteristics

(b) High thermal conductivity

(c) Anti-corrosive property

(d) High viscosity

Ans: d

Q73. Which of the following is not a drilling and boring tool?

(a) Auger

(b) Bradawl

(c) Gimlet

(d) Spoke

Ans: d

Q74. Forging temperature of brass is

(a) 550°C to 900 °C

(b) 100°C to 550°C

(c) 550°C to 1200°C

(d) 900°C to 1200°C

Ans: a

Q75. Spigot and Socket joint is a type of:

(a) Pipe joint

(b) Weld joint,

(c) Soldering

(d) Wood joint

Ans: d

Q76. In thread cutting process, which tap is used in last?

(a) Plug tap

(b) Bottoming tap

(c)Taper tap

(d) None of these

Ans: a

Q77. Gear finishing operation is called

(a) Shaping

(b) Milling

(c) Hobbing

(d) Burnishing

Ans: d

Q78. Buffing process is employed.

(a) To remove the material by CBN abrasive.

(b) To remove the material by diamond abrasive.

(c) To improve dimensional accuracy.

(d) To get perfectly flat surface.

Ans: a

Q79. A mortise gauge is a

(a) Striking tool

(b) Planing tool

(c) Boring tool

(d) Marking tool

Ans: d

Q80. Lap joint employed on plate having thickness:

(a) Less than 3 mm

(b) 5 to 10 mm

(c) 12.5 mm

(d) Above 25 mm

Ans: a

Q81. The taper in the lathe spindle is:

(a) 1:10

(b) 1:12

(c) 1:15

(d) 1:20

Ans: a

Q82. Which of the following is not the part of the carriage of a lathe?

(a) Saddle

(b) Cross-slide

(c) Tool post

(d) Tail-stock

Ans: d

Q83. For turning steep and short taper, which taper turning method is used?

(a) Compound rest method

(b) Tail-stock set over method

(c) Taper turning attachment method

(d) Forming tool method

Ans: a

Q84. High rate of material removal is in:

(a) EDM

(b) LBM

(c) USM

(d) ECM

Ans: d

Q85. Involute gear on a milling machine is cut by using

(a) Spiral cutter

(b) Slab milling cutter

(c) Angle milling cutter

(d) Differential indexing head

Ans:

Q86. Trepanning operation is for

(a) A large hole without drilling

(b) A finished drilled hole

(c) Enlarged hole after drilling

(d) None of these

Ans:

Q87. For high tensile strength material the abrasive recommended for grinding is:

(a) Al_2O_3

(b) SiO_2

(c) Ceramic sand

(d) Sand stone

Ans:

Q88. The degrees of freedom of a rigid body in space is:

(a) 3

(b) 6

(c) 12

(d) 18

Ans: c

Q89. Several machine tools can be controlled by a central computer in case of:

(a) DNC machine tool

(b) CNC machine tool

(c) NC machine tool

(d) ACS machine tool

Ans:

Q90. Which of the following jig is used for easily drilling a number of holes on a component from different angles?

(a) Ring Jig

(b) Box Jig

(c) Plate Jig

(d) Leaf Jig

Ans:

Q91. Binding material used in cemented carbide cutting tool is

(a) Graphite

(b) Lead

(c) Carbon

(d) Cobalt

Ans: d

Q92. In a machine tool, cutting force and power involved can be measured by:

(a) Comparator

(b) Dynamometer

(c) Transducer

(d) Pyrometer

Ans: b

Q93. What is the variation of cutting speed with tool life on log-log scale?

(a) Parabolic

(b) Straight line

(c) Elliptical

(d) Hyperbolic

Ans: b

Q94. The suitable cutting fluid for machining of alloy steel is

(a) Kerosene

(b) Water

(c) Dry

(d) Sulphurised mineral oil

Ans: d

Q95. A drill bit with zero rake angle is known as

(a) Flat drill

(b) Straight fluted drill

(c) Blind drill

(d) Parallel shank twist drill

Ans: b

Q96. The hardness of a grinding wheel is expressed by

(a) Letter/Alphabet

(b) Brinell hardness number

(c) Diameter of indentor

(d) Rockwell hardness number

Ans: a

Q97. Core print is used in moulding for:

(a) Supporting the core

(b) Making hollow space in mould

(c) Removing the core

(d) Making core

Ans: a

Q98. Which one of the following is not an advantage of timber reasoning?

(a) Wood becomes hard.

(b) Wood density decreases.

(c) Wood density increases.

(d) Wood becomes sensitive to fire

Ans: b

Q99. Draw cut type shaper cuts in

(a) Forward stroke

(b) Backward stroke

(c) Both the strokes

(d) None of these

Ans: b

Q100. If L = length of cut, N = rpm, f = feed/rev, then machining time in boring operation is expressed as:

(a) (f×N)/L

(b) (f×L)/N

(c) L/(N×f)

(d) $\frac{N}{(F \times L)}$

Ans: c

Q101. While performing thread cutting operation using a lathe machine, a single point thread cutting tool has

(a) Any value of rake angle

(b) Zero rake angle

(c) Positive rake angle

(d) Negative rake angle

Ans: b

Q102. In a metal machining operation, surface roughness is expressed as

(a) $Feed^2/4\times$ nose radius

(b) $Feed^2/8\times$ nose radius

(c) $Feed^2/12\times$ nose radius

(d) $Feed^2$/nose radius

Ans: b

Q103. For machining operation of Elbow pipe, which combination is used as work holding device

(a) Face plate with angle plate

(b) Face plate with dog plate

(c) Angle plate with dog plate

(d) None of these

Ans:

Q104. Which one among the following cannot be a specification of lathe machine?

(a) Size of chuck

(b) Distance between centres

(c) Length of bed

(d) Swing over diameter

Ans: a

Q105. In shaper, feed on the work-piece is provided by moving

(a) Vice

(b) Quick return mechanism

(c) Ram

(d) Table

Ans: d

Q106. Which cutting tool is used in the planer machine?

(a) Profile tool

(b) Single point cutting tool

(c) Double point cutting tool

(d) Multipoint cutting tool

Ans: b

Q107. The cutting velocity is minimum for following machining operation:

(a) Turning

(b) Drilling

(c) Grinding

(d) Milling

Ans: d

Q108. Which among the following, looks similar to planer type milling machine?

(a) Universal housing planing machine

(b) Single housing planing machine

(c) Rotary table planing machine

(d) Double housing planing machine

Ans:

Q109. Which standard taper is generally used in milling machine spindle?

(a) Brown and sharp taper

(b) Seller's taper

(c) Chapman taper

(d) Morse taper

Ans: a

Q110. String milling machine is used for

(a) Small work-pieces

(b) Large work-pieces

(c) Heavy and hollow work-pieces

(d) All of these

Ans:

Q111. Which of the following is not a lathe fixture?

(a) Four jaw chuck

(b) Collet

(c) Mandrels

(d) Arbor

Ans: d

Q112. To machine a hole or groove shape, which machine is used?

(a) Slotting machine

(b) Milling machine

(c) Broaching machine

(d) Cylindrical machine

Ans: c

Q113. Which one of the following is not a mechanism for the conversion of rotatory into translator motion?

(a) Slider-crank mechanism

(b) Rack and pinion mechanism

(c) Pitch mechanism

(d) Screw and nut mechanism

Ans:b

Q114. Which one of the following is not a type of maintenance of machine tool?

(a) Corrective maintenance

(b) Progressive maintenance

(c) Preventive maintenance

(d) Predictive maintenance

Ans:

Q115. Interchangeability can be achieved by

(a) Standardisation

(b) Better process planning

(c) Simplification

(d) Better product planning

Ans: a

Q116. Internal gears are made through

(a) Hobbing

(b) Shaping with pinion cutter

(c) Shaping with rack cutter

(d) Milling

Ans: b

Q117. Which one of the following is not a type of grinding wheel failure mode?

(a) Attritious wear

(b) Erosive wear

(c) Grain fracture

(d) Bond fracture

Ans: b

Q118. In terms of cutting tool material, CBN stands for:

(a) Carbon Boron Nitride

(b) Cubic Boron Nitride

(c) Cubic Borox Nitrogen

(d) Carbon Boron Nitrogen

Ans: b

Q119. The type of flow in which the velocity at any given time does not change with respect to space is called

(a) Steady flow

(b) Unsteady flow

(c) Rotational flow

(d) Compressible flow

Ans: a

Q120. The co-efficient of discharge of an orificemeter in comparison with a venturimeter is

(a) Equal

(b) Much smaller

(c) Much more

(d) None of these

Ans: b

Q121. Lathe bed is usually made of

(a) Structural steel

(b) Stainless steel

(c) Cast iron

(d) Mild steel

Ans: c

Q122. Lip angle of a single point tool is of the order of:

(a) 10° - 20°

(b) 30° - 45°

(c) 50° - 60°

(d) 60° - 80°

Ans: d

Q123. The locating and clamping elements are generally made from

(a) Epoxy concrete

(b) Steel

(c) Brass

(d) Aluminium

Ans: b

Q124. Which property of mercury is the main reason for use in barometers?

(a) High density

(b) Negligible capillary effect

(c) Very low vapour pressure

(d) Low compressibility

Ans: c

Q125. Multistage centrifugal pumps are used for:

(a) High discharge

(b) High head

(c) Pump viscous fluids

(d) All of these

Ans: d

Q126. The relation between hydraulic efficiency (η_h), mechanical efficiency (η_m) and overall efficiency (η_0) is:

(a) $\eta_h = \eta_0 \times \eta_m$

(b) $\eta_m = \eta_0 \times \eta_h$

(c) $\eta_0 = \eta_h \times \eta_m$

(d) None of these

Ans: c

Q127. The unit of surface tension is:

(a) N/m

(b) N/m^2

(c) N/m^3

(d) N-m

Ans: A

Q128. Impulse turbine is used for

(a) Low head

(b) High head

(c) Medium head

(d) High flow

Ans: B

Q129. Froude's number is the ratio of Inertia force to

(a) Pressure force

(b) Elastic force

(c) Gravity force

(d) Surface tension force

Ans: C

Q130. One poise is equal to

(a) 0.1 N-s/m^2

(b) 1 N-s/m^2

(c) 10 N-s/m^2

(d) 100 N-s/m^2

Ans: A

Q131. A piezometer tube is used for measuring

(a) Temperature

(b) Humidity

(c) Pressure

(d) None of these

Ans: C

Q132. If the flow is irrotational as well as steady, it is known as

(a) Unsteady flow

(b) Rotational flow

(c) Non-uniform flow

(d) Potential flow

Ans: D

Q133. Which of the following equation is known as momentum principle?

(a) $F = \frac{d(m^2 v)}{dt}$

(b) $F = \frac{dv}{dt}$

(c) $F = \frac{d(mv)}{dt^2}$

(d) $F = \frac{d(mv)}{dt}$

Ans: D

Q134. According to Chezy's formula, the discharge through an open channel is:

Where

A = Area of flow

C = Chezy's constant

m = hydraulic mean depth

i = uniform slope in bed

(a) $A\sqrt{m \times i}$

(b) $C\sqrt{m \times i}$

(c) $AC\sqrt{m \times i}$

(d) $mi\sqrt{A \times C}$

Ans: b

Q135. The channel flow is subcritical when Froude Number (Fr):

(a) Fr < 1

(b) Fr = 1

(c) Fr > 1

(d) Fr = - 1

Ans: a

Q136. Maximum discharge over a broad crested weir is given by: (Where the symbols have standard meanings)

(a) $Q = C_dLH^{3/2}$

(b) $Q = 0.5\ C_dLH^{5/2}$

(c) $Q = 1.705C_dLH^{3/2}$

(d) $Q = 1.705C_dLH^{5/2}$

Q137. In case of laminar flow, the loss of pressure head is proportional to

(a) Velocity

(b) $(Velocity)^2$

(c) $(Velocity)^{0.5}$

(d) $(Velocity)^{1.5}$

Ans: a

Q138. Stoke is the unit of

(a) Kinematic viscosity in C.G.S. unit

(b) Kinematic viscosity in M.K.S. unit

(c) Dynamic viscosity in M.K.S. unit

(d) Dynamic viscosity in S.I. unit

Ans: a

Q139. The maximum hydraulic efficiency of an impulse turbine

(Where $\theta = angle\ of\ blade\ tip\ at\ outlet$)

(a) $\left(\frac{1+cos\theta}{2}\right)$

(b) $\left(\frac{1-cos\theta}{2}\right)$

(c) $\left(\frac{1+sin\theta}{2}\right)$

(d) $\left(\frac{1-sin\theta}{2}\right)$

Ans: a

Q140. In case of fluid flow through pipes, cavitation is caused by:

(a) Low pressure below a limit.

(b) Weak material of pipe

(c) High pressure

(d) High velocity

Ans: a

Q141. For what value of depth of flow, the discharge over a broad crested weir is maximum?

(Where H is the available head)

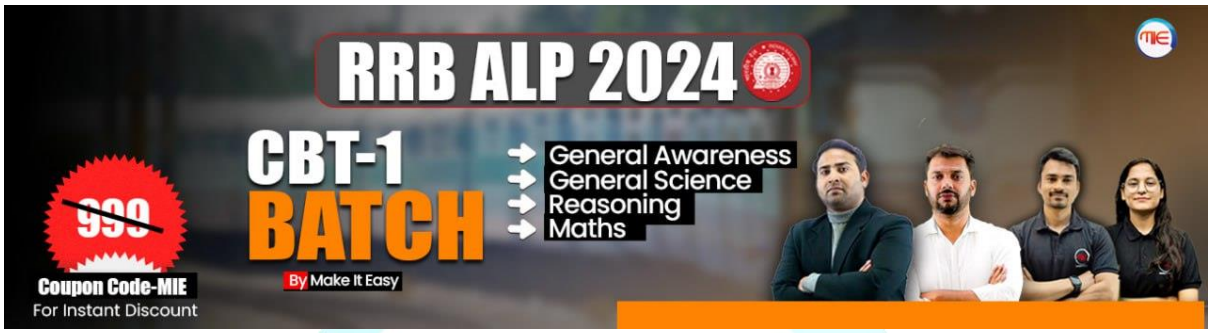
(a) H/3

(b) H/2

(c) H

(d) 2 H/3

Ans: d



Q142. The metacentric height of a ship is 0.1 m and the radius of gyration is 5 m. What would be the time of rolling of the ship? (Take g = 10 m/s²)

(a) 10 π sec

(b) 5 π sec

(c) 20 π sec

(d) 15 sec

Ans: a

Q143. Vapour compression cycle is modification of:

(a) Reversed Carnot cycle

(b) Rankine cycle

(c) Bell-Colman cycle

(d) None of these

Ans: d

Q144. The boiling point of Ammonia is:

(a) -100°C

(b) -50°C

(c) -33.3°C

(d) 0°C

Ans: c

Q145. The critical depth for a channel is given by:

Where q unit discharge through channel and g gravitational acceleration

(a) $\left(\frac{q}{g}\right)^{\frac{1}{2}}$

(b) $\left(\frac{q^2}{g}\right)^{\frac{1}{3}}$

(c) $\left(\frac{q^3}{g}\right)^{\frac{1}{4}}$

(d) $\left(\frac{q^4}{g}\right)^{\frac{1}{5}}$

Ans:

Q146. The efficiency of a hydraulic press is given by:

where

W=1 Weight lifted by Ram

P = Force applied on plunger

A = Area of Ram

a = Area of plunger

(a) $\frac{W}{P} \times \frac{A}{a}$

(b) $\frac{P}{W} \times \frac{a}{A}$

(c) $\frac{W}{P} \times \frac{a}{A}$

(d) $\frac{P}{W} \times \frac{A}{a}$

Ans: d

Q147. The loss of head at entrance in the pipe is equal to

(Where v = velocity of liquid in the pipe)

(a) $v^2/2g$

(b) 0.5 $v^2/2g$

(c) 0.375 $v^2/2g$

(d) 0.75$v^2/2g$

Ans: b

Q148. On psychrometric chart, wet bulb temperature lines are

(a) Horizontal lines

(b) Vertical lines

(c) Straight inclined lines

(d) None of these

Ans: c

Q149. The sensible heat factor is given by:

(Where S=Sensible heat, L=Latent heat)

(a) $\frac{S}{S+L}$

(b) $\frac{L}{S+L}$

(c) $\frac{S+L}{S}$

(d) $\frac{S}{S-L}$

Ans: a

Q150. The most suitable refrigerant for commercial ice plant is:

(a) Brine.

(b) Ammonia

(c) Freon

(d) Air

Ans: b

Q151. The humidifying efficiency is given by:

(Where B= Bypass factor during sensible cooling)

(a) 1-B

(b) B-1

(c) $\frac{1}{B}$

(d) $\frac{1}{1-B}$

Ans: a

Q152. The working fluid used for absorption refrigerators working on heat from solar collectors is a mixture of water and

(a) Carbon dioxide

(b) Sulphur dioxide

(c) Lithium Bromide

(d) Freon – 12

Ans: c

Q153. In vapour compression refrigeration system, at entrance to which component, the working fluid is super-heated vapour?

(a) Evaporator

(b) Condenser

(c) Compressor

(d) Expansion valve

Ans: b

Q154. Which of the following is undesirable property of refrigerant?

(a) Low viscosity

(b) Low freezing point

(c) Low latent heat of vaporization

(d) Satisfactorily miscible with lubricating oil.

Ans: c

Q155. Chemical formula for R22 refrigerant is

(a) Mono chloro di fluoro methane

(b) Tri chloro mono fluoro methane

(c) Di chloro mono fluoro methane

(d) Di chloro di fluoro methane

Ans: a

Q156. One Ton refrigeration is equal to:

(a) 50 kcal/min

(b) 50 kcal/hr

(c) 80 kcal/min

(d) 1000 kcal/day

Ans:

Q157. In a refrigerator, the flow of refrigerant is controlled by:

(a) Compressor

(b) Condenser

(c) Evaporator

(d) Expansion valve

Ans: d

Q158. Which of the following refrigeration plant requires no electricity?

(a) Vapour absorption

(b) Vapour compression

(c) Air refrigeration

(d) None of these

Ans: a

Q159. In an ideal vapour absorption system, the absorber pressure is equal to the pressure of

(a) Generator

(b) Condenser

(c) Evaporator

(d) Expansion device

Ans:

Q160. If air is heated without changing its moisture content, the dew point will_____.

(a) Increase

(b) Decrease

(c) Remain the same

(d) Be unpredictable

Ans: c

Q161. If air is passed over the cooling coils, this process is termed as:

(a) Sensible heating

(b) Cooling with humidification

(c) Cooling with dehumidification

(d) None of these

Ans: a

Q162. In a psychrometric process, if the sensible heat added is 30 kJ/s and latent heat added is 20 kJ/s, then the sensible heat factor will be:

(a) 0.3

(b) 0.6

(c) 0.67

(d) 1.5

Ans: b

Q163. The relative Coefficient of Performance (COP) is:

(a) Actual COP/theoretical COP

(b) Theoretical COP/actual COP

(c) Actual COP × theoretical COP

(d) $1 - \left(\frac{actual\ COP}{theoretical\ COP}\right)$

Ans: a

Q164. The higher temperature in vapour compression refrigeration cycle occurs at:

(a) Evaporator

(b) Condenser discharge

(c) Compressor discharge

(d) Expansion valve

Ans: c

Q165. Pick up the correct statement about giving up of heat from one medium to other in ammonia absorption refrigeration system.

(a) Strong solution to weak solution

(b) Ammonia vapour to weak solution

(c) Weak solution to strong solution

(d) Ammonia vapour to strong solution

Ans:

Q166. The normal boiling point of refrigerant R-11 in comparison to refrigerant R-12 is:

(a) Higher

(b) Lower

(c) Equal

(d) None of these

Ans:

Q167. In vapour compression refrigeration system, the sub-cooling of refrigerants in the condenser results in:

(a) Decrease in COP of the system

(b) Decrease in the size of the condenser

(c) Increase in the size of the evaporator

(d) Increase in the size of the compressor

Ans: c

Q168. When discharge pressure is too high in refrigeration system, why is high pressure control installed?

(a) To stop the cooling fan

(b) To stop water circulating pump

(c) To regulate the flow of cooling water

(d) To stop the compressor

Ans:

Q169. COP of air refrigerator is related with COP of vapour compression refrigerator as

(a) $(COP)_{air} > (COP)_{vap}$ C.

(b) $(COP)_{air} < (COP)_{vap}$ C.

(c) $(COP)_{air} = (COP)_{vip}$ C.

(d) None of these

Ans: b

Q170. Centrifugal compressor is a type of _____ compressor.

(a) Reciprocating

(b) rotary

(c) Both

(d) None of these

Ans: b

Q171. Which one of the following is a boiler mounting?

(a) Feed pump

(b) Fusible plug

(c) Superheater

(d) Economiser

Ans: b

Q172. Which of the following is not true about steam engine?

(a) These may be used in locomotive trains.

(b) They run on coal.

(c) They are a type of I.C. engine.

(d) Piston cylinder arrangement is there in a steam engine.

Ans: b

Q173. Which of the following is a water tube boiler?

(a) Lancashire boiler

(b) Babcock & Wilcox boiler

(c) Locomotive boiler

(d) Cochran boiler

Ans: b

Q174. Which of the following is not a boiler mounting?

(a) Blow off cock

(b) Feed check valve

(c) Economiser

(d) Fusible plug

Ans: c

Q175. The isothermal efficiency of a compressor is defined as

(a) Isothermal work / Actual work

(b) Adiabatic work / Actual work

(c) Actual work / Isothermal work

(d) Actual work / Adiabatic work

Ans:

Q176. Which of the following is a high pressure boiler?

(a) Lancashire boiler

(b) Benson boiler

(c) Locomotive boiler

(d) Cochran boiler

Ans: b

Q177. In which coal firing system coal is fed through compressed air?

(a) Pulverized firing

(b) Stoker firing

(c) Both (a) & (b)

(d) None of these

Ans:

Q178. Vertical lines on pressure-enthalpy chart shows:

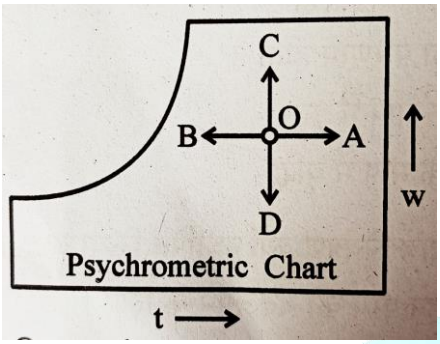
(a) Constant pressure lines

(b) Constant temperature lines

(c) Constant enthalpy lines

(d) Constant entropy lines

Ans.c



Q179.

On psychrometric chart, OC line represents

(a) Dehumidifying

(b) Heating

(c) Cooling

(d) Humidifying

Ans: d

Q180. The value of sensible heat factor quite common in air-conditioning practice in a normal dry climate is:

(a) 0.35 to 0.40

(b) 0.45 to 0.55

(c) 0.65 to 0.70

(d) 0.75 to 0.80

Ans: d